



# Market Monitoring in PJM PJM/NICA Markets in June

Illinois Commerce Commission  
Post 2006 Initiative  
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Joseph E. Bowring  
Market Monitoring Unit



## PJM's Operational Markets and Services

- Energy Markets
  - Day Ahead
  - Real Time
- Capacity Credits Markets
  - Daily
  - Long-Term
- Financial Transmission Entitlements Market
  - Auction Options
- Ancillary Services
  - Regulation Market
  - Spinning Reserve Market
  - Blackstart Service
  - Reactive Services

- Develop/modify market rules to **facilitate competition**
- **Limit returns to market power**
- Provide **incentives to competitive behavior**
- Make **exercise of market power more difficult**

- Monitor **compliance with rules**, standards, procedures and practices of PJM.
- Monitor **actual or potential design flaws** in rules, standards, procedures and practices of PJM.
- Monitor **structural problems** in the PJM market that may inhibit a robust and competitive market.
- Monitor the potential of Market Participants to **exercise undue market power**.

- **Discussion of issues** with relevant Market Participants; informal resolution of issues.
- **Issue demand letters** requesting a change in behavior by relevant Market Participants.
  - Provide demand letters to relevant Authorized Government Agencies.
- **Recommend modifications to rules**, standards, procedures and practices of PJM.
  - **Make recommendations** to PJM Committees or to PJM Board.
  - **Make regulatory filings** to address market issues and seek remedial measures.
- **Evaluate additional enforcement mechanisms.**

- Include diverse staff expertise
  - Economics/Engineering
  - Generation
  - Transmission
  - Power markets
  - Database/IT
- Build understanding of detailed market structure: macro/micro
- Build understanding of physical infrastructure
- Build understanding of operations
- Build in MMU data access/storage to RTO data designs
- Confidentiality protocols
- Complaint protocols

- Independent Internal Market Monitoring
  - Independent System Operator
  - ISO/RTO has no financial stake in market outcomes
  - ISO/RTO has independent Board
  - ISO and MMU are independent from all market participants
    - Market Monitoring Plan is not subject to modification by PJM members.
    - Amendment to PJM's Open Access Transmission Tariff subject to FERC approval
  - MMU is independent from ISO
- MMU Accountability
  - To FERC (per FERC MMU Orders and MM Plan).
  - To PJM Board.
  - To PJM President.

- Interaction with market participants is critical to understanding real markets
- Interaction with state Commissions is critical to understanding retail/wholesale interaction issues
- Interaction with RTO staff is critical to understanding real markets
- Coordination with FERC is essential to efficient monitoring and mitigation



- Market design
  - Market design critical for effective monitoring
  - Good market design does not obviate need for monitoring
- Market structure
  - Aggregate, supply-side market structure conditions not adequate to ensure competition
  - Transmission constraints limit competition in unpredictable ways
  - Full demand side participation a prerequisite - complex regulatory interactions to create required infrastructure
- Need to define market power as clearly as possible
  - Communicate definition to participants
  - Explain specific examples as they arise
- Need to define consequences of exercising market power
  - Explain specific examples as they arise

- Subtle and complex ways to exercise market power
- Generally not aggregate market issue
- Operating reserves
- Bid parameters
- Retirements/mothballing
- Ramp violations
- Loop flows
- FTR/Inc/Dec
- Creation of congestion

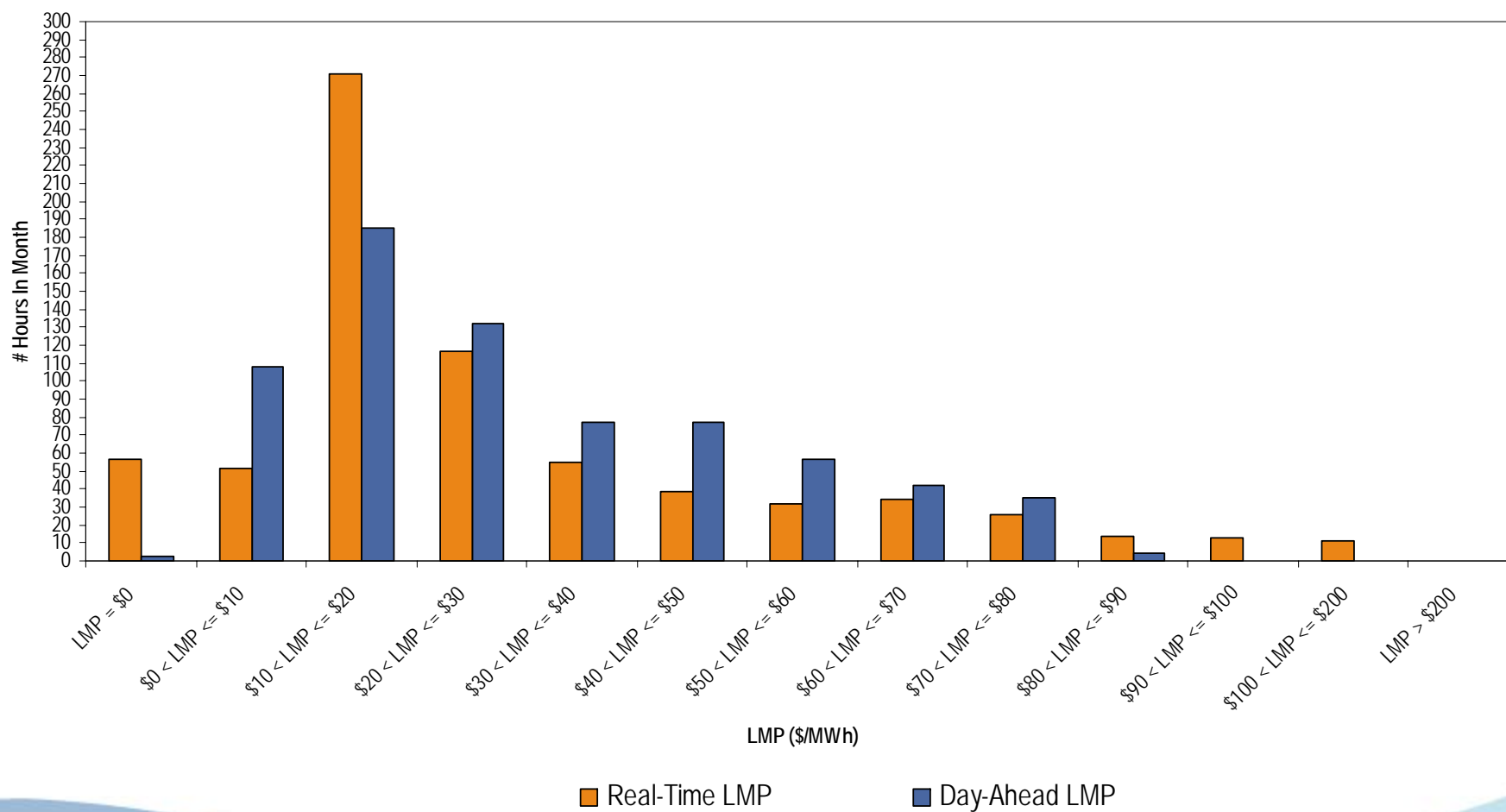
## NICA market results – May/June 2004

- Overall, the integrated NICA markets functioned well and effectively.
- The NICA energy market results were reasonably competitive.
- Pathway flows have increased competition in NICA and in PJM CA.
- Interface pricing has been reasonably effective.
- FTRs in NICA have provided an effective congestion hedge.
- Congestion has been limited.
- Financial offer and bid levels reflect an active use of PJM hedging instruments.

## Energy market prices – June 2004

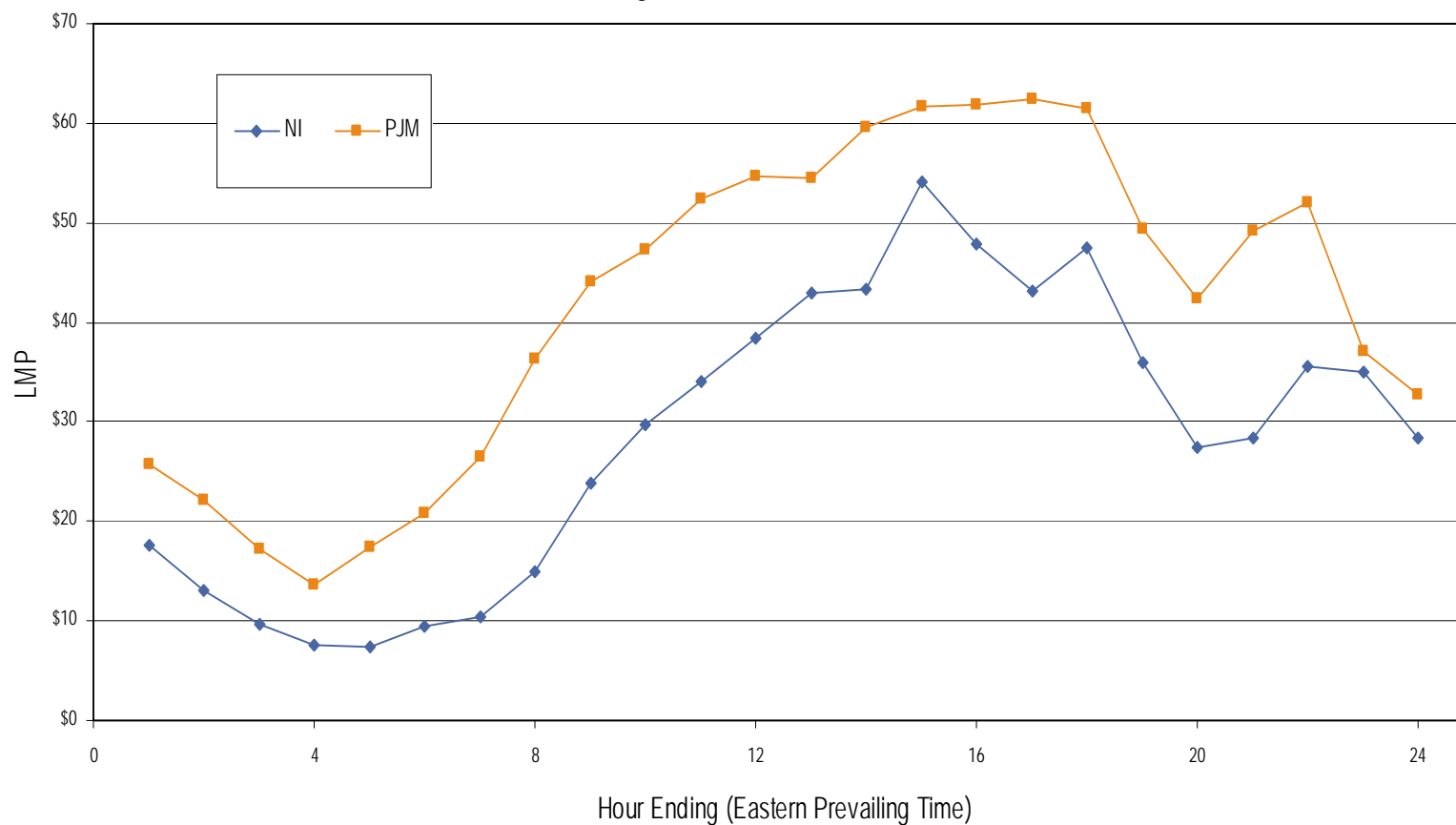
- NICA real-time zonal LMP was less than \$30 per MWh for 69 percent of the hours.
- NICA day-ahead zonal LMP was less than \$30 per MWh for 60 percent of the hours.
- PJM CA real-time LMP was greater than NICA real-time LMP by an average of \$13.19 per MWh.
- PJM CA day-ahead LMP was greater than NICA day-ahead LMP by an average of \$12.40 per MWh.

# NICA Zonal LMP - June 2004



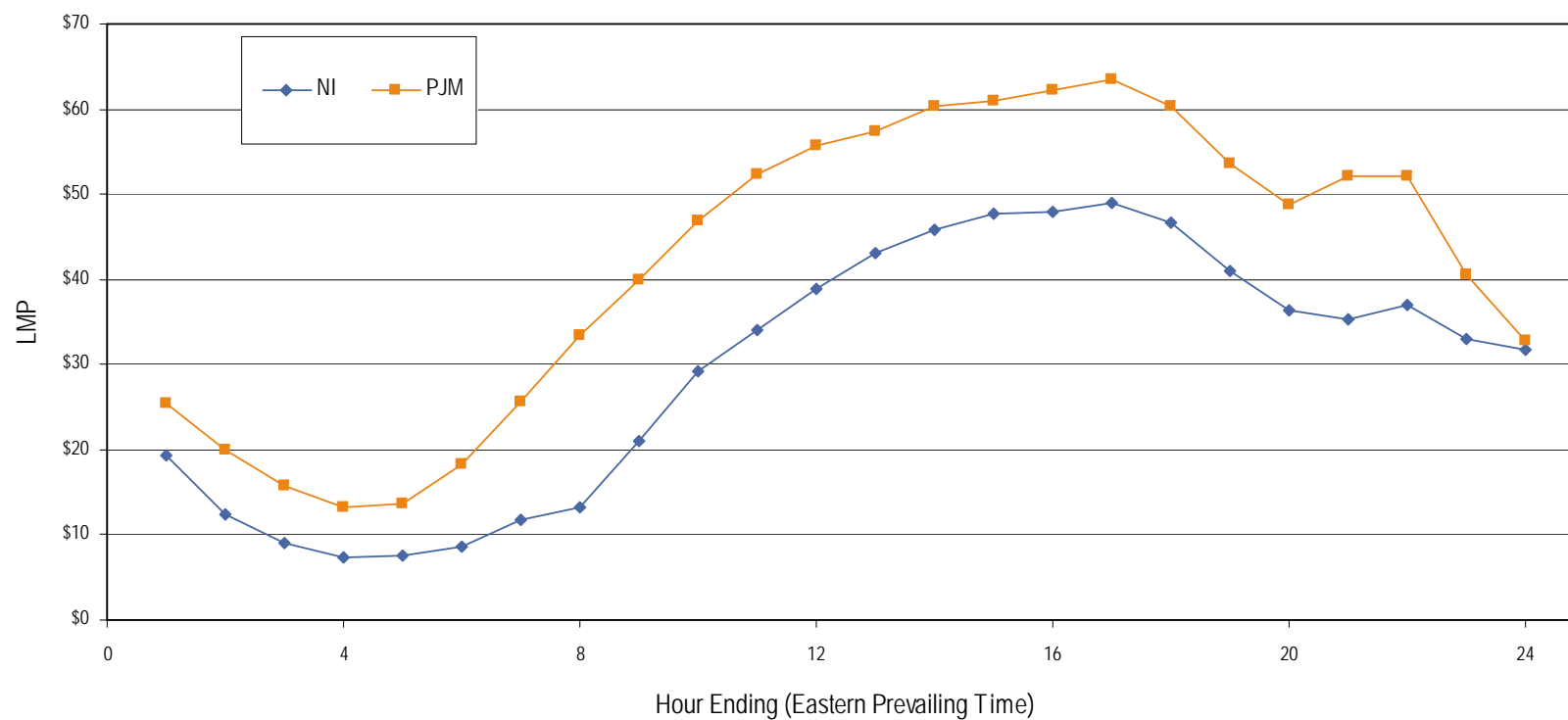
## Average Hourly Real-Time LMP - June 2004

Average LMP Difference for June: \$13.19



## Average Hourly Day-Ahead LMP - June 2004

Average LMP Difference for June: \$12.40



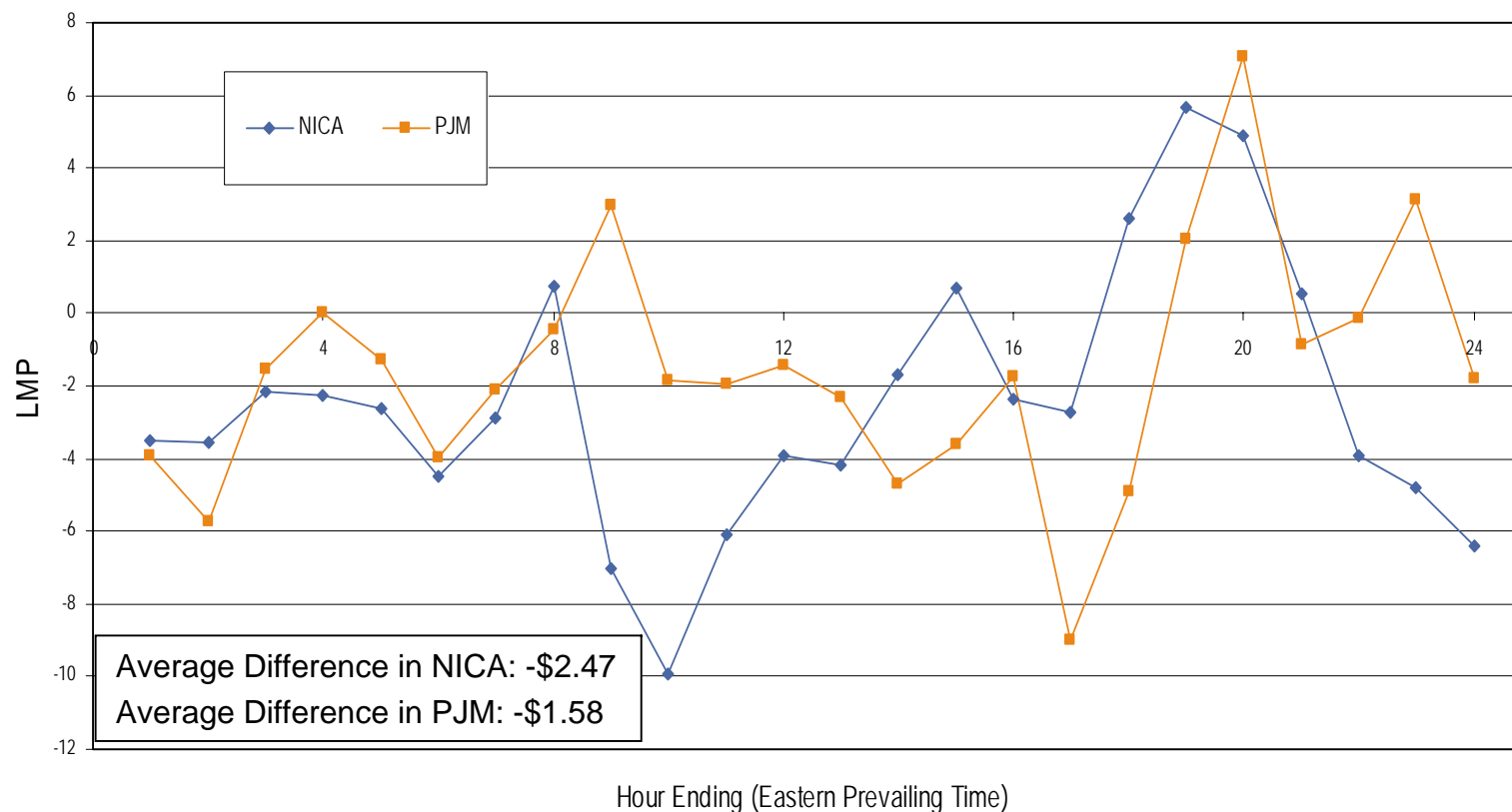
## Energy market price differentials – May and June 2004

- NICA day-ahead zonal LMP was less than NICA real-time zonal LMP in May. The average hourly difference was \$2.47 per MWh.
- PJM CA day-ahead zonal LMP was less than PJM CA real-time zonal LMP in May. The average hourly difference was \$1.58 per MWh.
- NICA day-ahead zonal LMP was greater than NICA real-time zonal LMP in June. The average hourly difference was \$0.91 per MWh.
- PJM CA day-ahead zonal LMP was greater than PJM CA real-time zonal LMP in June. The average hourly difference was \$0.12 per MWh.



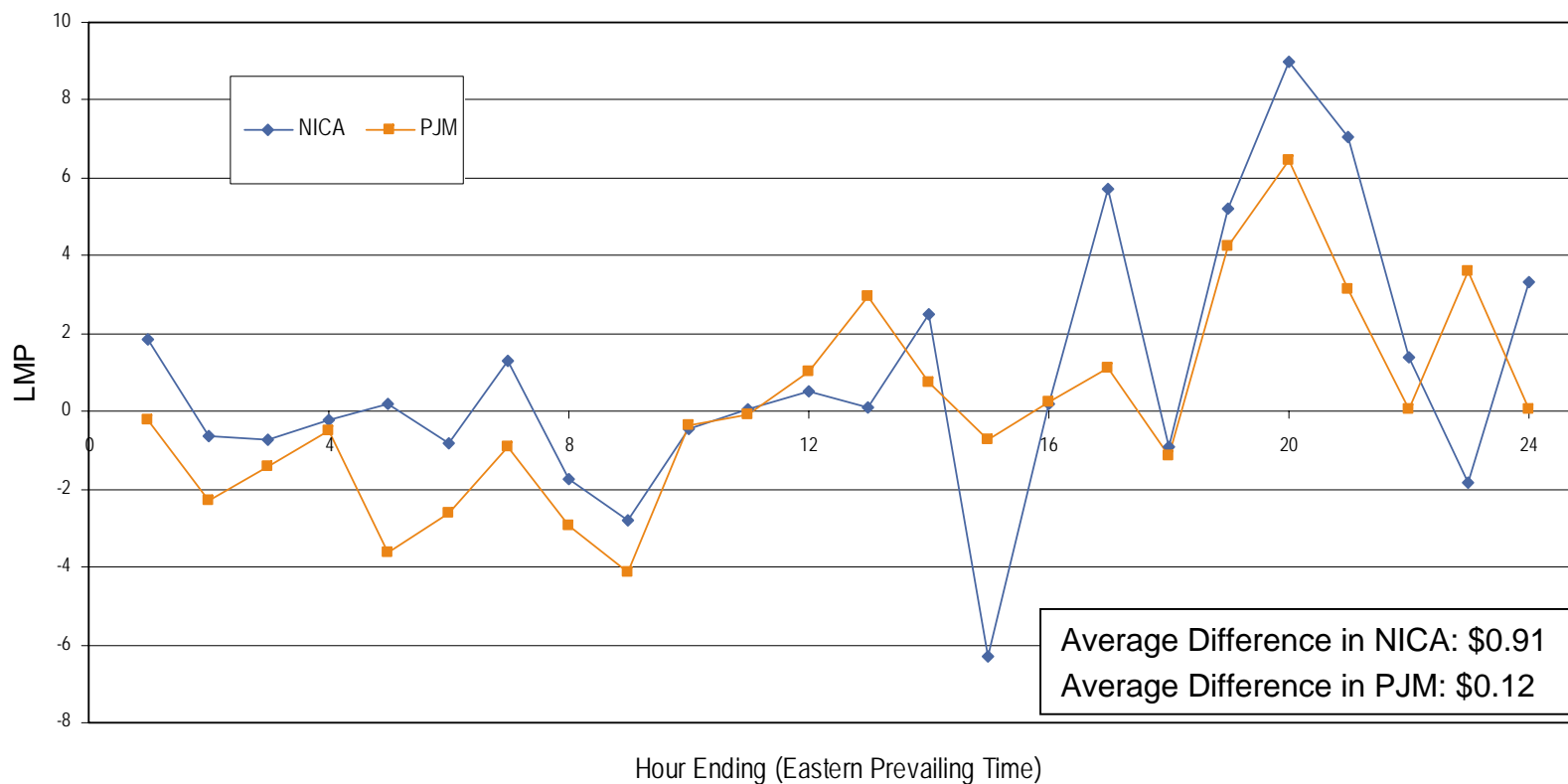
## Average Hourly Difference of Day-Ahead and Real-Time LMPs

May 2004



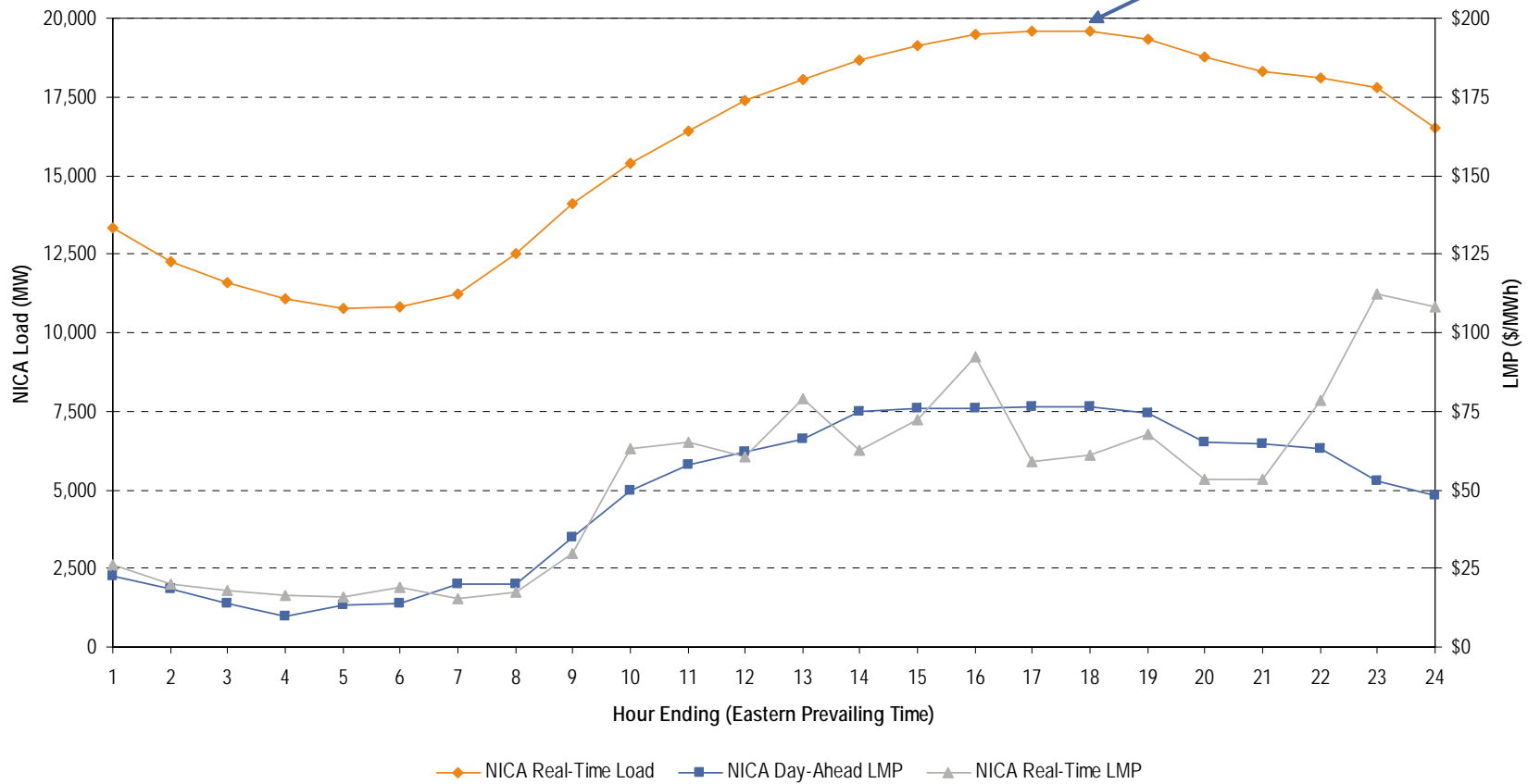
## Average Hourly Difference of Day-Ahead and Real-Time LMPs

June 2004

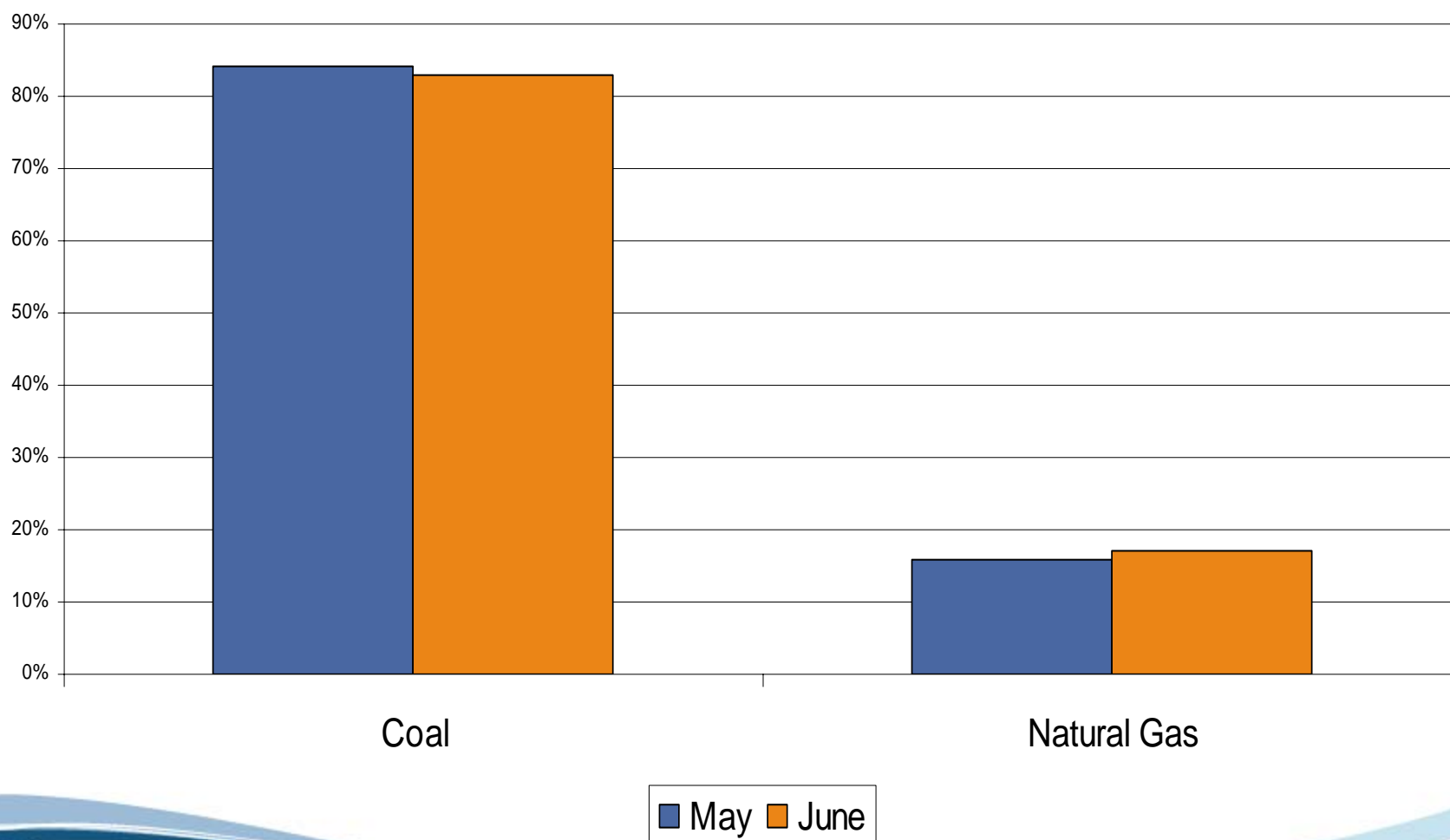


## NICA Peak Demand for 2004 through June 30th June 8, 2004

6/8/04 - 1800 EPT NICA 19,586 MW



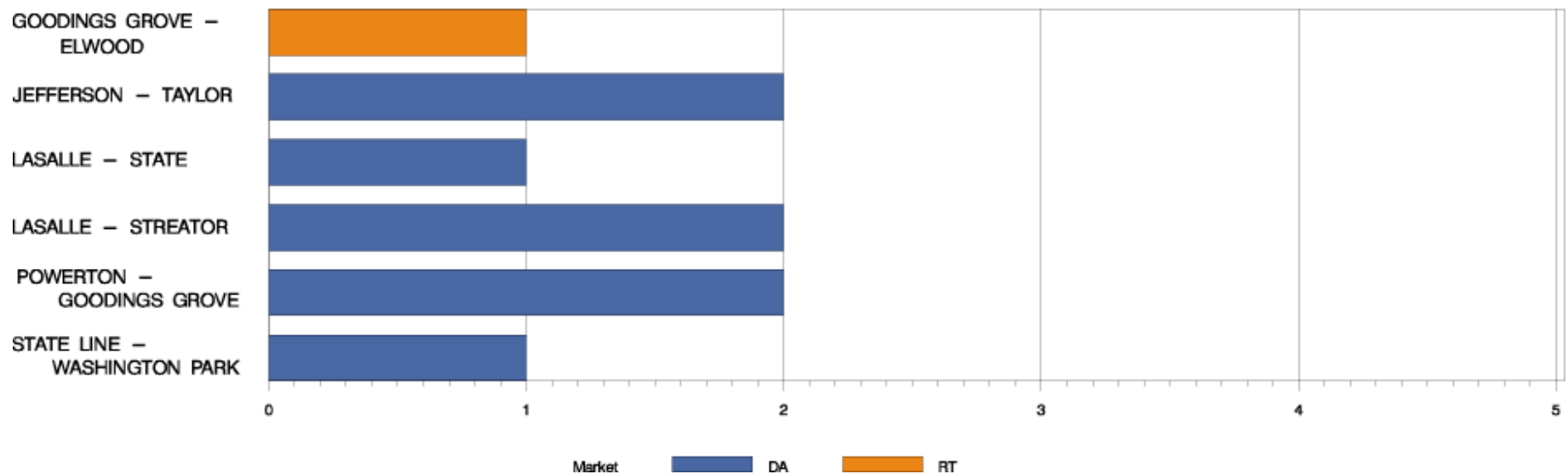
## Fuel of NICA Marginal Units



## NICA Congestion for June 2004

- Congestion was very limited in NICA in June.
- Day-Ahead Market congestion:
  - 8 event hours
- Real-Time Market congestion:
  - 1 event hour
- No NICA units were offer-capped in the Real-Time Markets in June 2004.
- No NICA units were offer-capped in the Day-Ahead Markets in June 2004.

## NICA Congestion Event Hours by Facility JUNE 2004



## Real-time pathway statistics for June 2004

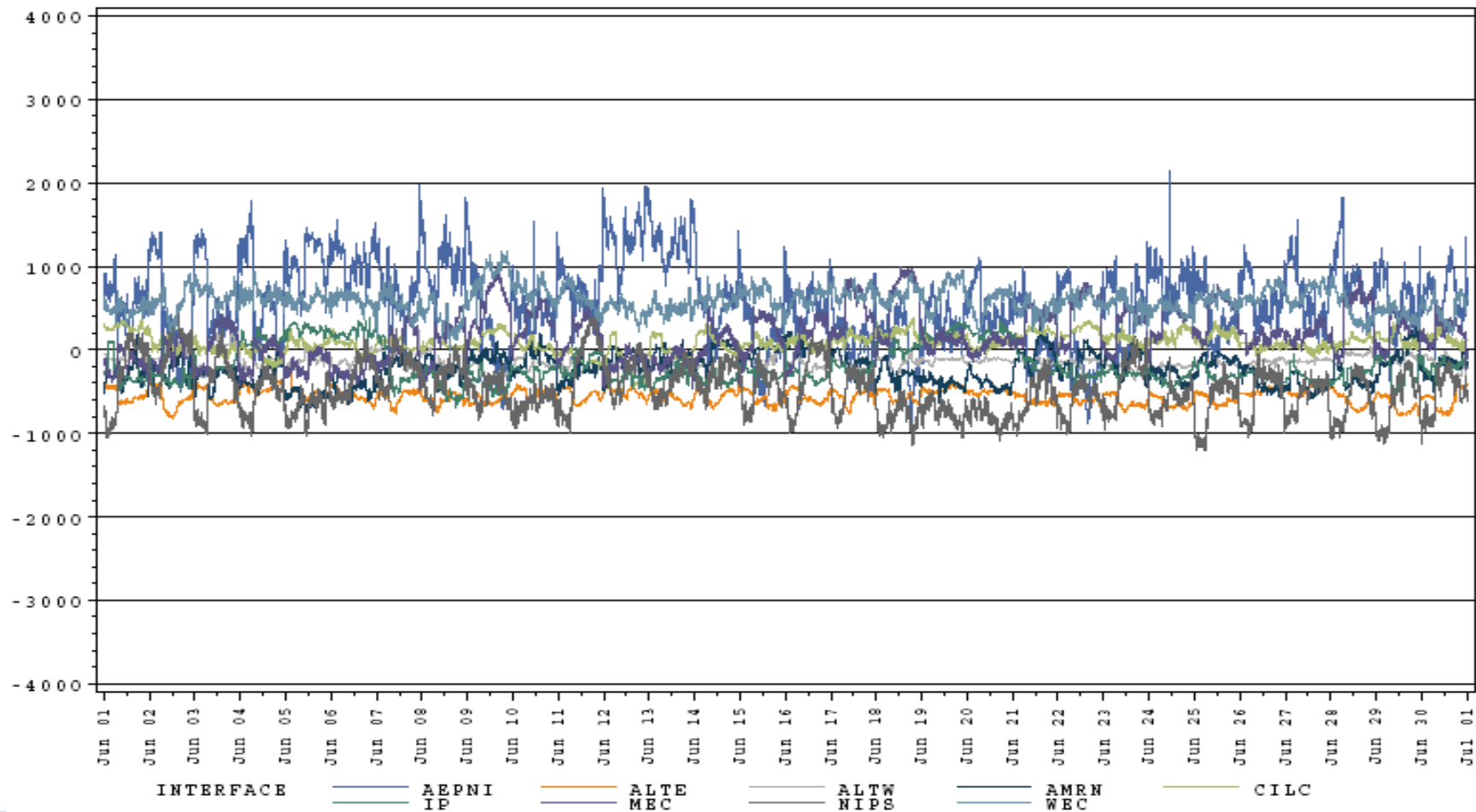
- Pathway limited from NICA to PJM 354 hours, or 49 percent.
- Pathway limited from PJM to NICA 65 hours, or 9 percent.
- Pathway not limited for 301 hours, or 41 percent.
- Pathway flowed from NICA to PJM for 485 hours, or 67 percent.
- Pathway flowed from PJM to NICA for 235 hours, or 33 percent.

## Day-ahead pathway statistics for June 2004

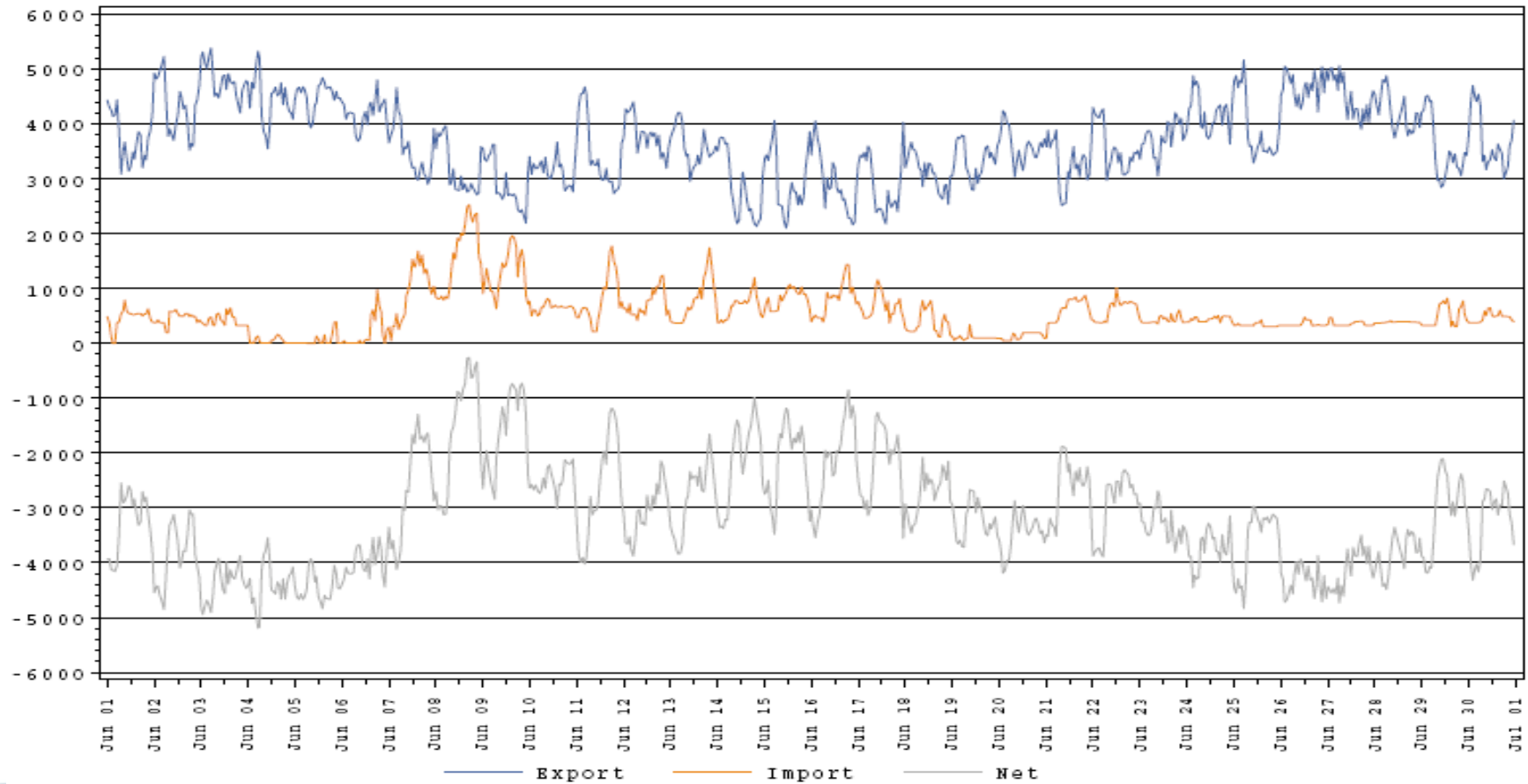
- Pathway limited from NICA to PJM 478 hours, or 66 percent.
- Pathway limited from PJM to NICA 82 hours, or 11 percent.
- Pathway not limited for 160 hours, or 22 percent.
- Pathway flowed from NICA to PJM for 585 hours, or 81 percent.
- Pathway flowed from PJM to NICA for 135 hours, or 19 percent.
- The direction of flow on the pathway is primarily a function of interface price differentials.



## NICA Actual Minus Scheduled Tie Flows June 2004

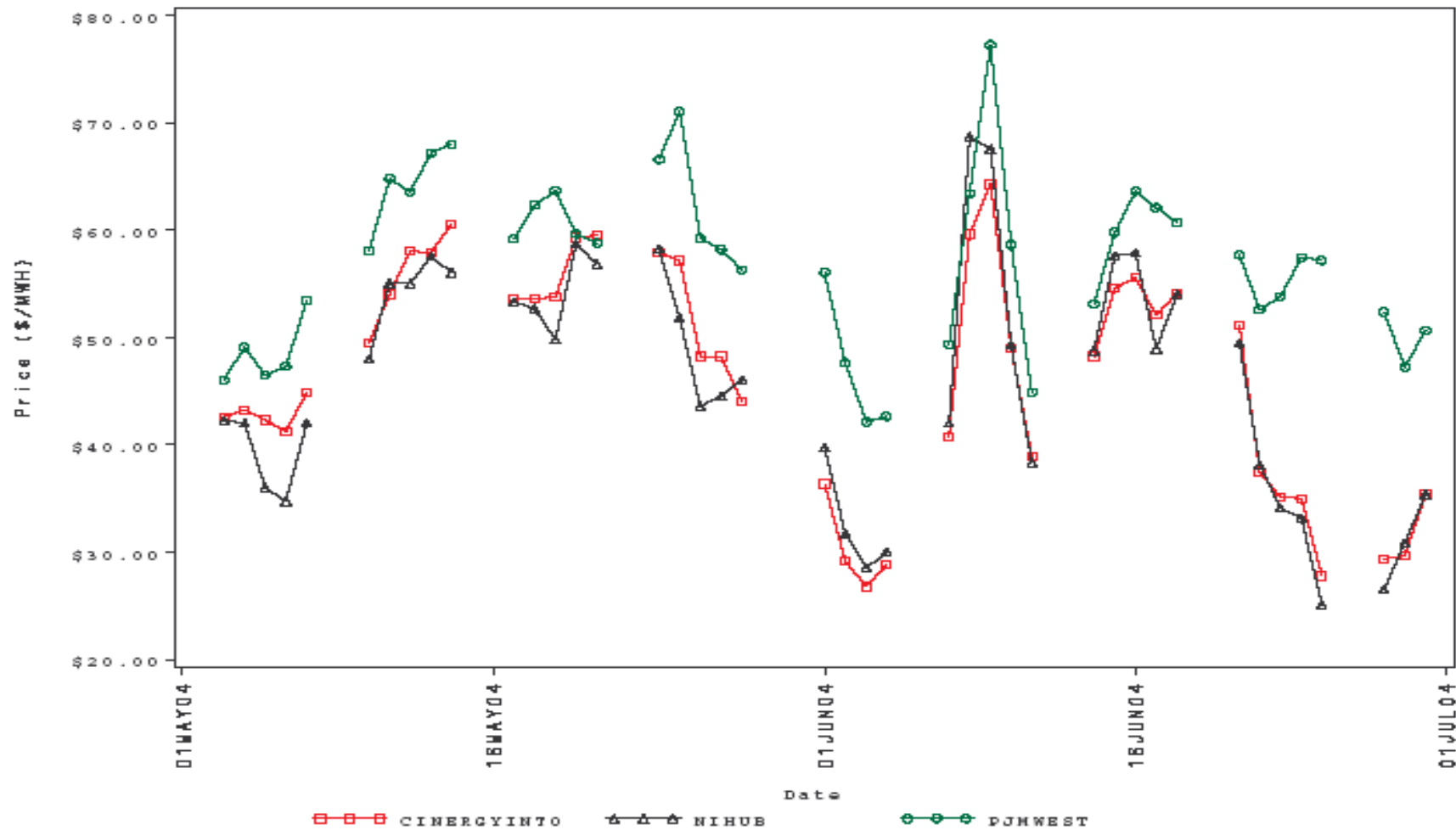


## NICA Imports, Exports and Net June 2004



- Daily forward prices for NIHub and CINergy tracked closely in June.
  - The maximum daily NIHub – CINergy spread was \$9.05 per MWh during June.
  - The average daily NIHub – CINergy spread was \$0.75 per MWh during June.
  - The NIHub – CINergy spread was \$0.00 per MWh on the final trading day of June.

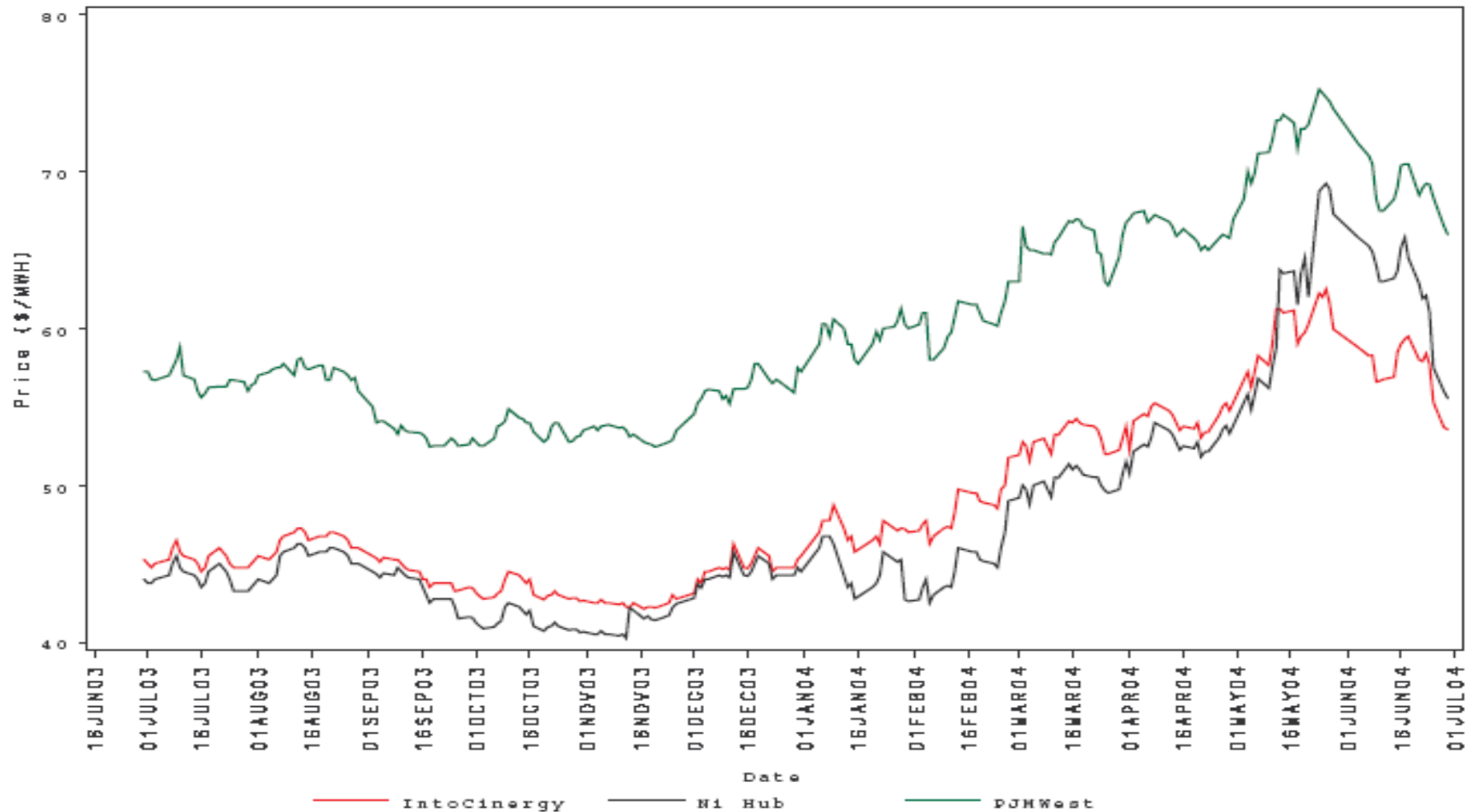
Cinergy, NIHub and PJM Dailies  
Platts Data



- Forward prices for the July-August contract showed varying spreads during June.
  - Spreads reflect traders' expectations about future prices.
  - The maximum NIHub – CINergy spread was \$7.40 per MWh during June.
  - The average NIHub – CINergy spread was \$5.12 per MWh during June
  - The NIHub – CINergy spread was \$2.00 per MWh on the final trading day for the July-August contract.

## Cinergy, NIHub and PJM West Forward Prices

Platts Data  
Jul - Aug 2004 Contract

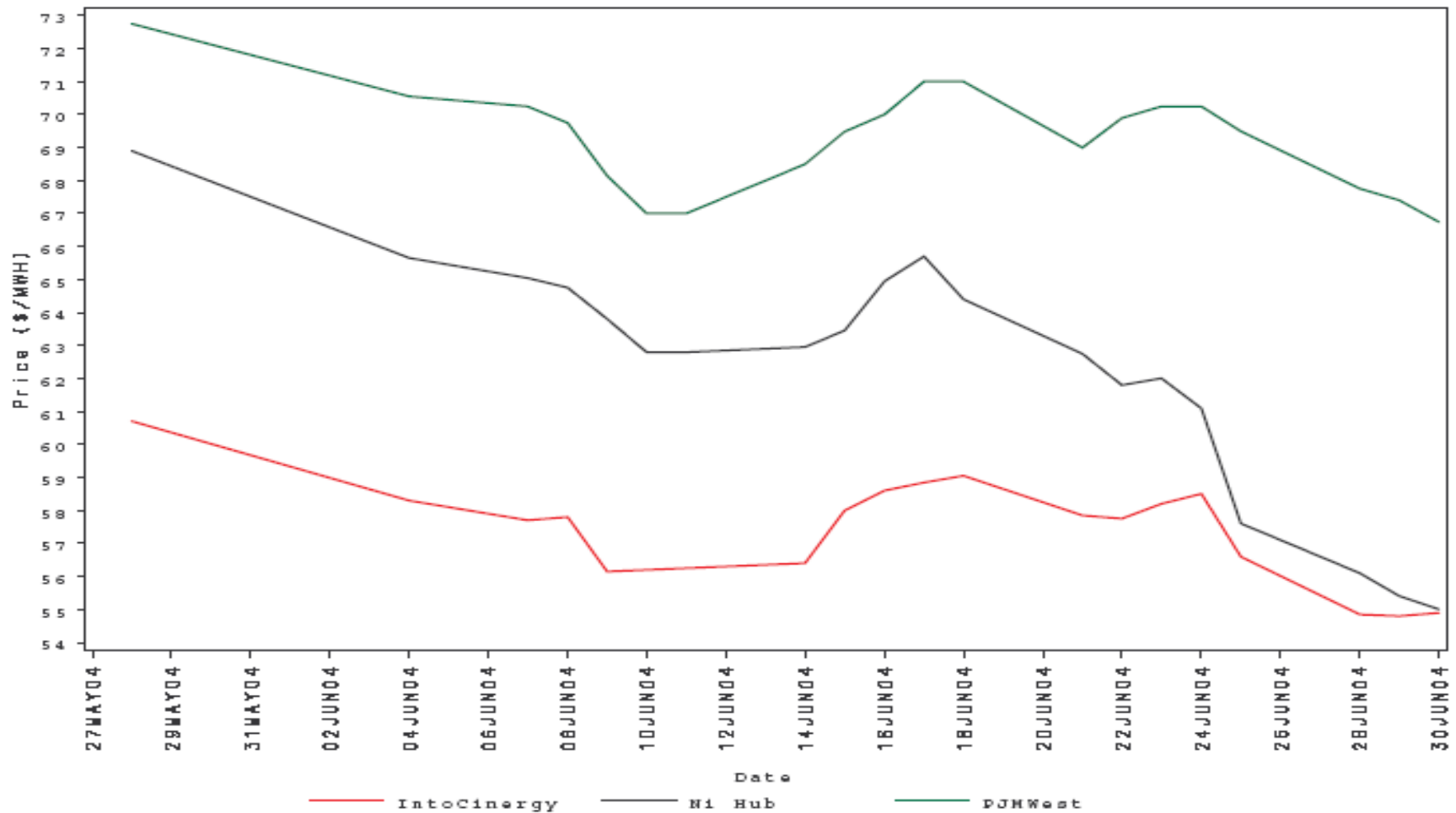


- Forward prices for the August contract showed varying spreads during June.
  - Spreads reflect traders' expectations about future prices.
  - The maximum NIHub – CINergy spread was \$7.65 per MWh during June.
  - The average NIHub – CINergy spread was \$4.81 per MWh during June
  - The NIHub – CINergy spread for the August contract was \$0.10 per MWh on the final day of June.



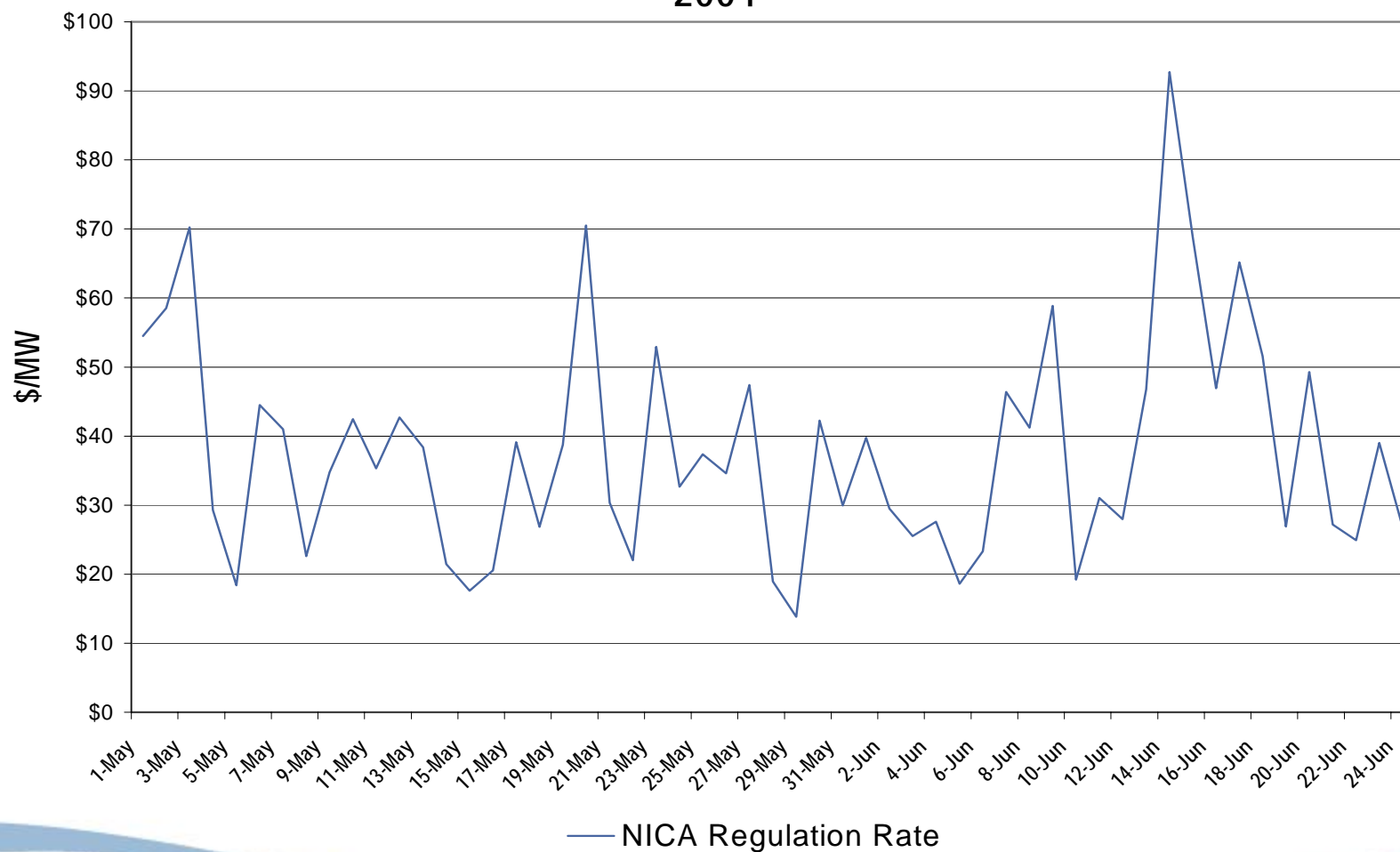
## Cinergy, NIHub and PJM West Forward Prices

Platts Data  
Aug 2004 Contract





## NICA Daily Regulation Cost per MW 2004

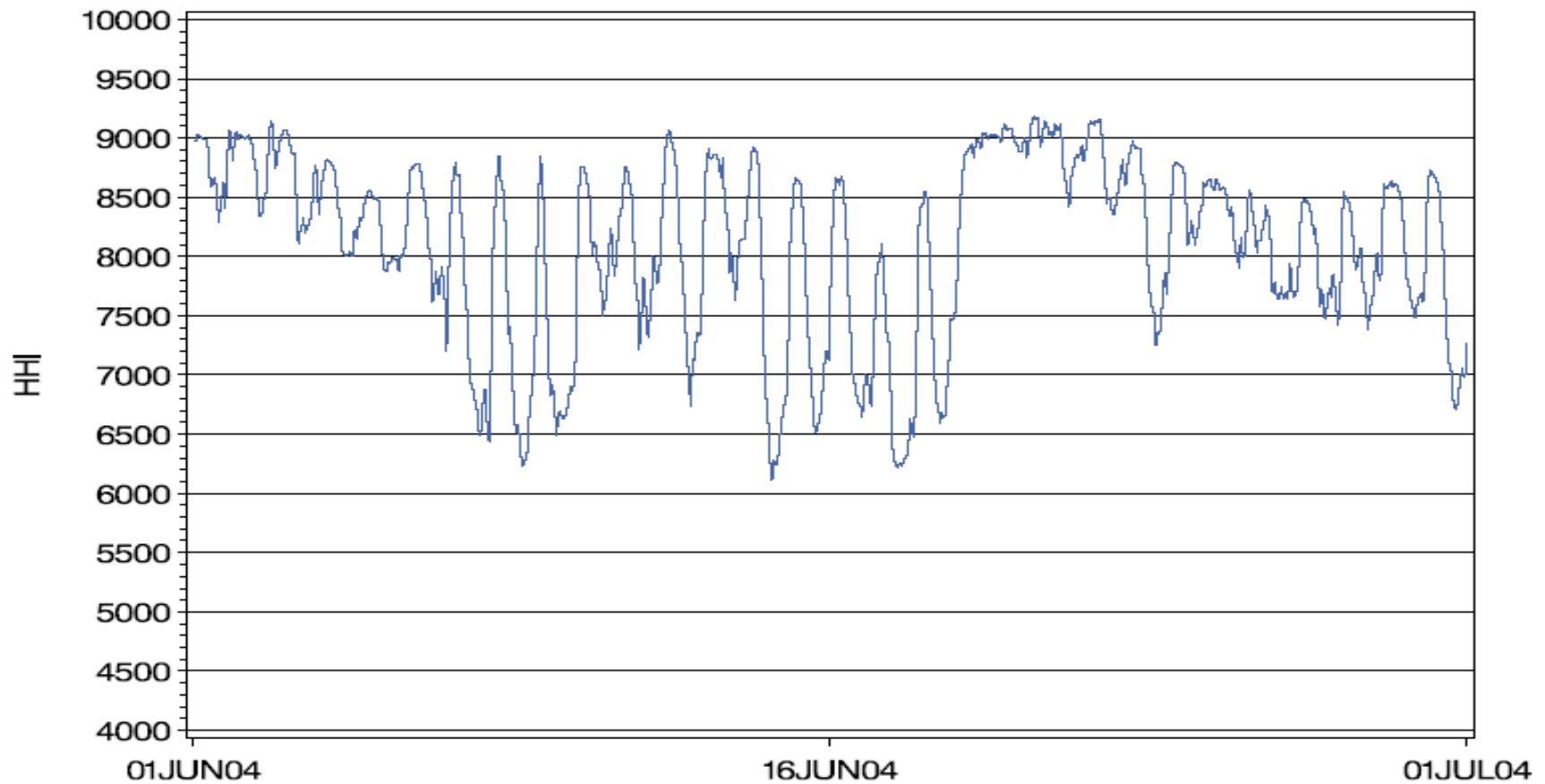


- NICA Capacity Market structural tests indicate significant potential market power.
- Results of NICA Capacity Market auctions were generally less than the proposed offer cap.

- Average capacity price per MW for the summer 2004 period was \$30.39.
- Average capacity price per MW for the fall 2004 period was \$25.88.
- Average capacity price per MW for the winter 2004/2005 period was \$25.66.
- Average capacity price per MW for the full planning period was \$27.86.

- The NICA energy market had high HHIs during June.
  - High HHIs reflect highly concentrated ownership of the units supplying energy on an hourly basis.
- The NICA energy market had low RSIs during June.
  - RSIs less than 1.0 indicate that a single supplier is pivotal during the hour.
- The pathway flows served to provide competitive pressures in the NICA energy market, offsetting the stand-alone structural market power concerns.

## NICA Hourly Energy Market HHI JUNE 2004



## NICA Residual Supply Index – May 2004 (Revised)

Number of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.10	Percent of Hours RSI < 1.00	Overall Average RSI	Overall Minimum RSI
426	337	57%	45%	0.93	0.69

## NICA Residual Supply Index – June 2004

Number of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.10	Percent of Hours RSI < 1.00	Overall Average RSI	Overall Minimum RSI
570	470	77%	63%	0.85	0.47